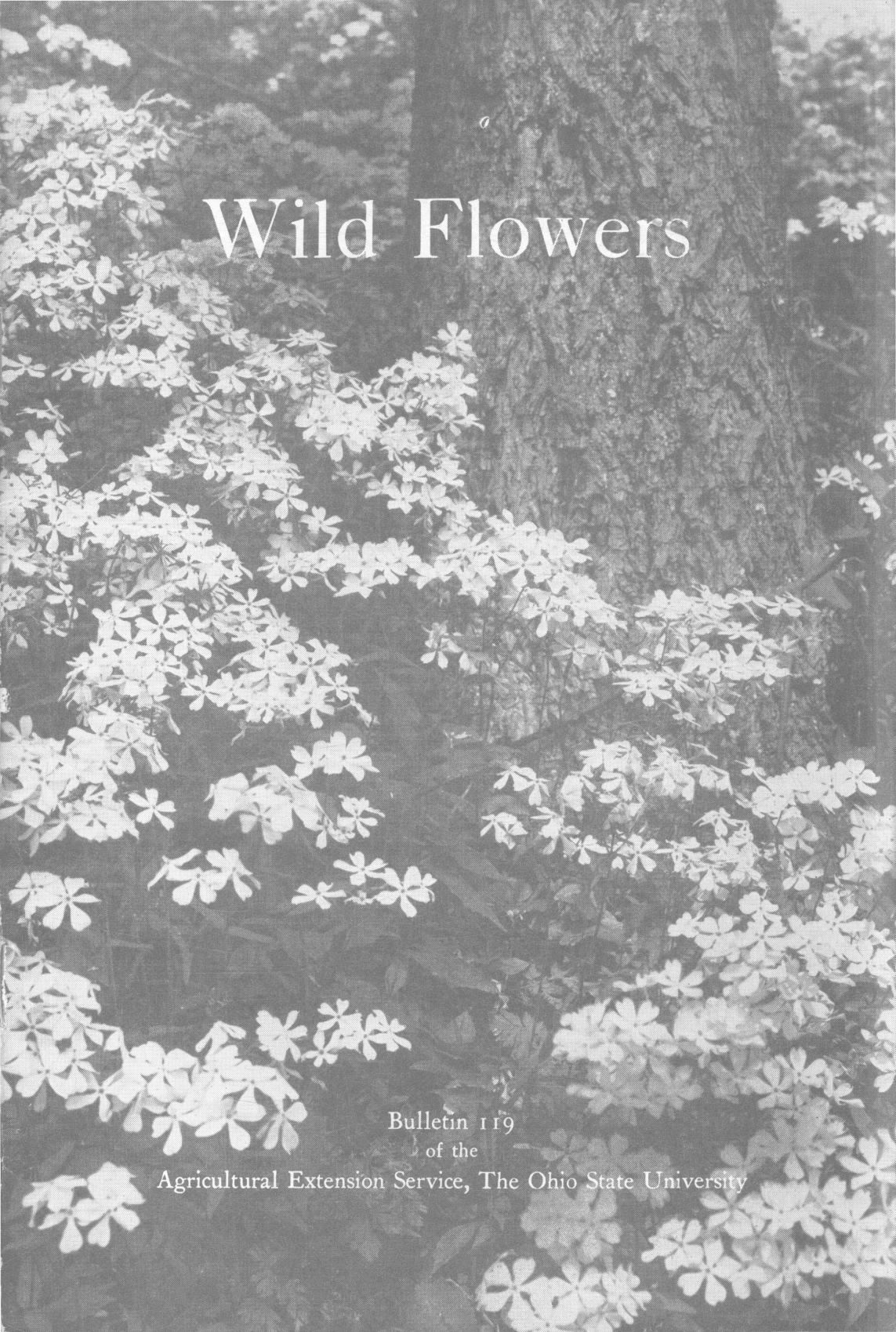

Wild Flowers

Bulletin 119
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Wild Flowers

By
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THOUSANDS of people in the state of Ohio are finding their most healthful forms of recreation in the out-of-doors. The automobile has led directly to the development of a splendid system of highways and the establishment of new state and municipal parks. For the first time many of us are coming in contact with old gray beech trees, brilliant scarlet tanagers, orange-colored mushrooms, and large blue Lobelias. A thousand objects of interest are certain to arouse an inborn curiosity about nature. Several well-illustrated books have been written to help those who really want information about the wild life around them. A number of splendid volumes concerning wild flowers are here mentioned as references. (See page 28.)

In the paragraphs which follow there are some suggestions on gathering wild flowers and on using them in decoration. Many species are abundant or locally so common that they may be picked without much danger of extinction. Others are rare or so restricted in habitat that they are in urgent need of protection. This bulletin is intended to stimulate an interest in the wild flowers of our state and to present a rational point of view in regard to their use.

Wild Flowers and Weeds

Flowering plants which grow without cultivation and which we admire because of form and color are called wild flowers. Those which become pests in cultivated fields, pastures, and lawns are called weeds. It presents a problem to the farmer to eradicate such plants from his land. To a city-dweller the sight of a field of Goldenrod and Purple Ironweed in late summer may call forth an expression of delight. To the farmer on whose land such plants are growing they may be decidedly unwelcome tenants.

On the other hand, the Ragweeds (Ambrosia), the Pigweeds (Amaranthus), and the Goosefoots (Chenopodium) are popular with no one. The Ragweeds have been convicted of being the source of much of the "hay fever" hitherto blamed on the Goldenrod. For the most part these are weeds of cultivated fields and the farmer knows how to deal with them.

Weeds in pasture land usually indicate low fertility or overgrazing. Where a good bluegrass sod is developed the majority of weeds do not get a start. Those which do become established can be removed with a scythe or corn-knife before they go to seed.

Many of the weeds are not so entirely obnoxious as is sometimes believed. A "weed patch" may harbor a number of small but useful songbirds. Song sparrows frequently build nests in clumps of Goldenrod. Other species which may nest in low vegetation of this type in Ohio are the field sparrow, vesper

sparrow, dickcissel, and northern yellow-throat. We can scarcely doubt the distinct value of these birds to agriculture. May we not go a bit too far in the spoilation of nature to our own economic loss?

Wild Flowers Along the Highways

It is not an uncommon sight in Ohio to see gangs of men employed to "mow the weeds" along public roads. No one can doubt the wisdom of removing tall weeds, shrubs, and small trees which interfere with a clear view of sharp curves and dangerous crossroads. However, it is difficult to see why Sunflowers and Goldenrods, Asters and Coneflowers should be sacrificed along straight stretches of road where they lend patches of color to monotonous landscapes.

The roadside plants also furnish nesting sites for a number of useful birds. During the summer of 1930 sixteen bob white nests were destroyed on a single two-mile stretch of road in Union County as a result of "mowing the weeds." This count was made by ornithologists employed by the Ohio Division of Conservation.

Use of Wild Flowers in Decoration

Fig. 1.—Gathering an armful of daisies makes little impression on this field.

A number of our "wild flowers" lend themselves to decorative purposes. Early spring flowers, as a rule, do not last long when picked and placed indoors. The Common Blue Violet (*Viola papilionacea*) is an exception, and has merited its popularity because of its long flower stalks. The Ox-eye Daisy (*Chrysanthemum leucanthemum*) blooms prolifically in June on some of our poorest soils. Because of its abundance, the flowers are often picked in large quantity, and hundreds of blossoms crowded into a pail. This shows poor taste. Fewer flowers, relieved by those of some other color or a bit of green foliage, are far more attractive.

Fig. 2.—Beauty in the commonplace can be found in this wild flower portrait of the **Oxeye Daisy.**

Fig. 3.—Sneezeweed commonly blooms in late summer along many of our streams.

Grasses and sedges, picked just before the seed is ripe, have unlimited decorative value, alone or in combination with a few other flowers.

The coarse brilliant weeds of late summer and early fall include several species of Asters and Goldenrods, Black-eyed Susan, Prairie Niggerhead, Jerusalem Artichoke, Purple Ironweed, Joe-Pye-weed, and Boneset; they require judicious treatment to get the proper effect. Cattails are in the same class. A tall, heavy vase is needed for display. All of these plants require water and plenty of light to appear at their best. Change the water daily to prevent fouling.

In the winter, dark green stalks of Thicket Horsetail *(Equisetum prealtum)* may be placed in a tall vase on the floor or on a low tabouret. These interesting plants will retain their natural colors without water and without sunlight.

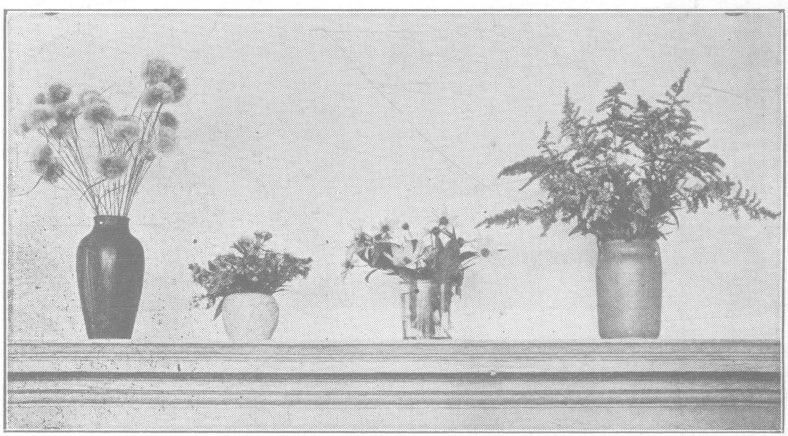

Fig. 4.—Wild flowers that have decorative value for home use. Left to right: Cotton-grass, Asters, Sunflowers, and Goldenrod.

Some Abundant Wild Flowers

Many of our wild flowers are so abundant that they may be picked in large quantities. The presence of perennial underground parts, the production of viable seed in large quantities, and the ability to grow rapidly when established are only a few of the characteristics of these plants. Some are foreign to the state, having been introduced accidentally, or, in a few cases, intentionally. Under certain conditions they are regarded as weeds. Nevertheless, these plants include many of our showiest wild flowers. Their use in decoration should be encouraged. The free use of plants in the following list will only make room for more of their kind.

List of Flowers That May Be Picked in Quantity

Aster, New England *(Aster nova-angliae)* and others.
Black-eyed-Susan *(Rudbeckia hirta)*
Blackberry *(Rubus alleghaniensis)*
Boneset *(Eupatorium perfoliatum)*
Bouncing-bet or Soapwort *(Saponaria officinalis)*. Introduced.
Bulrush, Dark Green *(Scirpus atrovirens)* and others.
Buttercup, Swamp *(Ranunculus septentrionalis)* and others.
Butter-and-eggs *(Linaria vulgaris)*. Introduced.
Cattails *(Typha latifolia and T. angustifolia)*.
Clover, Red *(Trifolium pratense)* and others. Introduced.
Daisy, Oxeye *(Chrysanthemum leucanthemum)*. Introduced.
Dandelion *(Leontodon taraxacum)*. Introduced.
Five-finger or Cinquefoil *(Potentilla sp.)*
Goldenrod, Canada *(Solidago canadensis)* and others.
Grasses of many kinds. Several introduced species.
Healall *(Prunella vulgaris)*. Introduced.
Indian-hemp *(Apocynum cannabinum)*.
Ironweed, Purple *(Veronica altissima)*.
Jerusalem-artichoke *(Helianthus tuberosus)*.
Joe-Pye-weed *(Eupatorium purpureum)*.
Milkweed, Common *(Asclepias syriaca)*
Mints *(Mentha sp.)* of many kinds. Mostly introduced.
Motherwort *(Leonurus cardiaca)*. Introduced
Moth Mullein *(Verbascum blattaria)*. Introduced.
Mullein, Great or Common *(Verbascum thapsus)*. Introduced.
Mustard, Black *(Brassica nigra)*. Introduced.
Oxeye, Smooth *(Heliopsis helianthoides)*
Queen-Anne's lace or Wild Carrot *(Daucus carota)*. Introduced.
Rush, Common *(Juncus effusis)* and others.
Sedge, Fox *(Carex vulpinoidea)* and others.
Sweet Clover *(Melilotus alba and M. officinalis)*. Introduced.
Teasel, Wild *(Dipsacus sylvestris)*. Introduced.
Thistle, Canada *(Cirsium arvense)*. Introduced.
Vervain, Blue *(Verbena hastata)*.
Vervain, White *(Verbena urticifolia)*.
Yarrow or Common Milfoil *(Achillea millefolium)*.

Suggestions on Gathering Wild Flowers

There is a large group of people who would rather see wild flowers preserved in their natural setting than to see them carried home. A society of Large Flowered Trilliums in a wooded glen is far more pleasing than the same plants in a crockery jar. Complete preservation is most necessary in small woodlots and parks near large cities, where a few wild flower collectors may destroy natural beauty available to thousands.

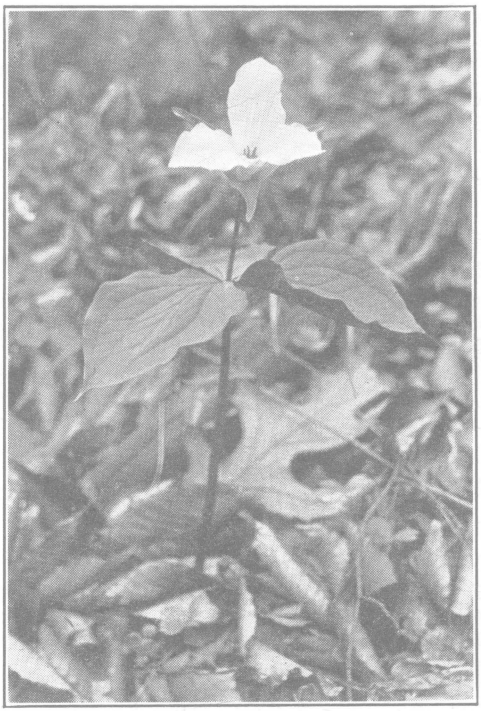

Fig. 5.—The large flowered Trillium is certain to disappear if unprotected.

After all, there are only a few legitimate reasons for collecting wild flowers. The home decorator appreciates the vase of cut flowers on the breakfast table. The artist and the naturalist may require specimens for study. Others keep them as souvenirs of pleasant journeys afield. If our common flowers were picked in moderation, there would be no occasion for criticism. Wild flowers, like garden flowers, should be picked thoughtfully. Whether intended for home decoration or herbarium specimens, care should be taken in collecting them. A knife or scissors should be used, or else the stems should be broken off sharply, to avoid injuring the roots.

One should be careful not to remove all of the leaves in picking flowers from perennials. The green leaves of the plant are its food factories. Unless the plant can manufacture food in excess of its immediate needs, none will accumulate in its storage organs. The next season's growth is very largely dependent on the foods which are stored in aerial stems, tubers, rootstocks and bulbs.

It should be borne in mind, also, that picking flowers usually removes potential seed. When a colony of plants becomes reduced to a few individuals the chances for seed production and survival of the colony are very slight indeed. Especially is this true of annuals and biennials. As an arbitrary rule, one should never take a flower out of a woods when fewer than a dozen plants of its kind are present.

Under no circumstances should wild flowers, except the most abundant weedy kinds, be gathered when there is no provision for taking care of them during the journey home. A large market basket containing damp newspapers is a handy substitute for the botanist's vasculum; the plants are thus prevented from drying out until the return home. They should be watered and kept out of the hot sun, at least until the leaves look well. Then the flowers may be arranged to suit the purpose intended.

Common Native Wild Flowers

A number of our native wild flowers are common enough that they may be picked in localities where they seem abundant. This list includes many of the spring flowers which deck our woodlands in April and May. It includes the following:

Anemone, Rue *(Anemonella thalictroides)*
Anemone, Tall *(Anemone virginica)*
Bellflower, Tall *(Campanula americana)*
Bergamot, Wild *(Monarda fistulosa)*
Bitter-cress, Purple *(Cardamine douglassii)*
Bluets *(Houstonia coerulea)*
Blue-flag, Common *(Iris virginica)*
Butterfly-weed *(Asclepias tuberosa)*
Crane's-bill, Carolina *(Geranium carolinianum)*
Dogtooth-violet *(Same as Fawn-lily)*
Dutchman's-breeches *(Bicuculla cucullaria)*
Fawn-lily or White Adder's-tongue *(Erythronium americanum)*
Fire Pink or Catchfly *(Silene virginica)*
Geranium, Wild *(Geranium maculatum)*
Hawthorns or Red Haws *(Species of Crataegus)*
Hepatica or Liver-leaf *(Hepatica triloba and H. acutiloba)*
Jack-in-the-pulpit *(Arisaema triphyllum)*
Lobelia, Blue *(Lobelia syphilitica)*
Loosestrife, Fringed Yellow *(Steironema ciliatum)*
Lungwort, or Virginia-bluebells *(Mertensia virginica)*
Mayapple or Mandrake *(Podophyllum peltatum)*
Milkweed, Swamp *(Asclepias incarnata)*
New-Jersey-tea *(Ceanothus americanus)*
Phacelia, Pursh's *(Phacelia purshii)*
Phlox, Wild blue *(Phlox divaricata)*
Rose, Swamp *(Rosa carolina)*
Rose, Virginia *(Rosa virginiana)*
Sneezeweed, or Helen's-flower *(Helenium autumnale)*
Spring-beauty *(Claytonia virginica)*
Squirrel-corn *(Bicuculla canadensis)*
St. John's-wort, Spotted *(Hypericum punctatum)*
Toothwort, Cutleaf *(Dentaria laciniata)*
Valerian, Greek *(Polemonium reptans)*
Violet, Common Blue *(Viola papilionacea)*
Violet, Striped *(Viola striata)*

Flowers in Need of Protection

It is difficult to realize that Ohio was once a wilderness of almost unbroken forest. Certainly no more than 5 per cent of the total land area of the state consisted of open prairie, shallow swamps, and treeless bogs. The forest cover has largely been removed from all but the steepest hill country. Most of the prairies, swamps, and bogs have been drained and brought under cultivation. Consequently, many of the native wild flowers which grew in these habitats have disappeared with them. The importation of mixed seed for field and forage crops has resulted in the introduction of a host of weeds. It is not strange that a number of our native wild flowers are becoming rarer and rarer each year and some are now threatened with extinction. The following flowers are especially in need of protection in Ohio:

Fig. 6.—There are few sights more beautiful than the white blossoms of the Flowering Dogwood in May. Mutilation of the trees has made protection necessary.

Azaleas. The Flame Azalea is now one of our rarest shrubs, while the Pink Azalea is nearly as scarce.

Baneberries *(Actaea alba* and *A. rubra)*

Bird-foot Violet *(Viola pedata* and *V. pedatifida)*

Bittersweet or Waxwork *(Celastrus scandens)*. The popularity of this climber for winter decoration has led to its destruction in the vicinity of the larger cities, although there are many places in the state where it is still common.

Black Cohosh or Black Snakeroot *(Cimicifuga racemosa)*

Blazing-star, Dense*(Liatris spicata)* and other species.

Bloodroot *(Sanguinaria canadensis)*. In many woodlands, this may still be regarded as a common spring wild flower. However, it will not survive indiscriminate picking. Besides, its flowers last only a short time.

Blue-eyed-Mary *(Collinsia verna)*. This annual depends on seed-production for survival.

Buckbean *(Menyanthes trifoliata)*. In Ohio this interesting plant grows only in sphagnum bogs. The only practical method by which such plants can be preserved is to preserve their habitats.

Bunchberry or Dwarf Dogwood *(Cornus canadensis)*

Bush Honeysuckle *(Diervilla)*

Canada Violet *(Viola canadensis)*

Canadian Burnet *(Sanguisorba canadensis)*

Cardinal-flower *(Lobelia cardinalis)*

Climbing Fumitory *(Adlumia fungosa)*

Columbine *(Aquilegia canadensis)*. Cutting the flower stalks will not injure the plants, which are easily uprooted.

Cone-flower, Purple *(Brauneria purpurea)*

Crested Iris *(Iris cristata)*. Our only dwarf Iris is in danger of extinction. Plants intended for use in rock gardens should be purchased from a dealer who propagates wild plants.

Culver's-root *(Veronica virginica)*

Flowering Dogwood *(Cornus florida)*. The mutilation of these trees annually by thoughtless persons is little short of criminal. A new West Virginia law forbids the picking of flowers within a hundred yards of a highway without the written consent of the landowners. Let us hope that Ohioans will have sufficient pride in preserving the beauty of their highways that such a law will be unnecessary.

Fig. 7.—The Purple Cone-flower is native to a few scattered prairie regions of the state, and should be saved.

Foam-flower or False Mitrewort *(Tiarella cordifolia)*

Fringed Gentian *(Gentiana crinita)*. This as well as other gentians are indeed scare in Ohio. They depend on seed production for continuation of the species.

Ginseng *(Panax quinquefolia)*

Golden-seal *(Hydrastis canadensis)*

Goat's-beard *(Aruncus sylvester)*

Grass-of-Parnassus *(Parnassia caroliniana)*

Groundnut *(Apios tuberosa)*

Indian-pipe *(Monotropa uniflora)*. These strange colorless "Ghost-plants" of the woodland turn black when bruised or picked.

Lady's-slippers (various *Cypripediums)*. This group of orchids has several representatives in the state, all in danger of extinction. Preserve for others to enjoy.

Lady's-tresses, Slender *(Spiranthes gracilis)* and other species.

Fig. 8.—Prickly-pear is the only Cactus native to our state. Its lemon-yellow flowers are nearly three inches across.

Marsh Marigold *(Caltha palustris)*. Our only native yellow "cowslips" are becoming rarer on account of the drainage of swampy places.

Meadow Lily *(Lilium canadense)*. There are few places where these native lilies are found today. If picked, the stems should be cut short, so that a quantity of leaves remain on the growing plant.

Mitrewort or Bishop's-cap *(Mitella diphylla)*.

Moss-pink or Creeping Phlox *(Phlox subulata)* carpets some of the poorest soils in eastern Ohio with its colorful blossoms in May. Plants intended for rock gardens should be purchased from growers.

Mountain Laurel *(Kalmia latifolia)*. The same laurel which has made famous the hills of New England blooms in the hill country of eastern Ohio during the month of June. Its destruction in many localities is a source of concern to all who enjoy outdoor life.

Painted-cup *(Castilleja coccinea)*

Partridge-berry *(Mitchella repens)*

Pink Corydalis *(Corydalis sempervirens)*

Pipsissewa *(Chimaphila umbellata)*

Pitcher-plant *(Sarracenia purpurea)*. On account of the drainage of bogs for muck land, there are few localities in Ohio where this unusual plant can be found today.

Purple-flowering Raspberry *(Rubus odoratus)*

Purple Milkwort *(Polygala viridescens)* and other species.

Rattlesnake-plantain *(Epipactus pubescens)*

Redbud *(Cercis canadensis)*. Like the Flowering Dogwood, this tree is often stripped of its branches in the spring, when the clusters of pink blossoms are particularly attractive.

Rhododendron or Great-laurel *(Rhododendron maximum)*. Although this shrub forms dense thickets at higher altitudes in the Alleghenies it is found in only a few shady ravines in Ohio. Rhododendrons can be successfully grown from seed and those intended for landscaping should be purchased from a nursery.

Rose Gentian or Rose-pink *(Sabbatia angularis)*. Like other members of the gentian family, the plants are produced each year or two from seed. Picking the flowers of course prevents seeding.

Shadbush *(Amelanchier canadensis)*. Besides possessing showy flowers this shrub or small tree has attractive fruit, which has led to its popular names: Juneberry, Service-berry or "Sarviss."

Shinleaf *(Pyrola elliptica)* and other species of Pyrola.

Shooting-star *(Dodecatheon meadia)*. Although a perennial, it is now becoming scarce and will not survive digging. Plants are furnished by nurseries for wild flower gardens.

Showy Orchis *(Galeorchis spectabilis)*. All Orchids are decidedly rare in Ohio. Although thousands of seeds may be produced by some plants each year, they are almost microscopic, poorly developed, and rarely germinate in nature.

Spotted Wintergreen *(Chimaphila maculata)*

Stargrass *(Hypoxis hirsuta)* is uncommon and even rare in many parts of the state. Picking the leaves with the flowers is almost certain to be fatal.

Steeplebush or Hardback *(Spiraea tomentosa)*

Fig. 9.—On account of draining swamps and bogs where they once grew, we have destroyed most of these queenly plants, the Showy Lady's-slippers.

Trailing Arbutus *(Epigaea repens)*. The hills of eastern Ohio boast of this little gem among the wild flowers. Frequently the whole plant is pulled up when the flowers are picked. Cutting a few sprays with a knife or shears will not injure the plant.

Trillium, all species except *T. sessile*. In order to get specimens with long stems, the leaves are usually picked too. The three leaves below the flower make all the food during the growing season; removing them causes the roots to starve.

Trout-lily or Fawn-lily. *(Erythronium americanum)*. These plants are also popularly known as dogtooth-violets and yellow adder-tongues. It requires six or seven years for these to grow from seed.

Turk's-cap Lily *(Lilium superbum)*

Turtlehead *(Chelone glabra)*

Twinflower *(Mitchella repens)*. In the Canadian forests this little plant reproduces abundantly, but in our own state it is scarcely holding its own.

Twinleaf *(Jeffersonia diphylla)*. These flowers have but a short season of bloom. The petals fall very easily, especially after the flowers have been pollinated.

White Wild-indigo *(Baptisia leucantha)*. A spectacular prairie species, it is rarely seen in Ohio on account of the intensive cultivation of the soil where it once grew. Another species, the Blue Wild-indigo *(Baptisia australis)* in even rarer.

Wild Sarsaparilla *(Aralia nudicaulis)*

Wild Senna *(Cassia marylandica and Cassia medsgeri)*.

Wood Lily *(Lilium philadelphicum)*. Unlike the Meadow-lily, this native lily grows on dry hillsides, in oak woods and in thickets. It usually bears only one flower to a stalk and therefore merits our protection.

The Damage from Grazing in Woodlots

Perhaps the greatest damage to wild flowers has been due not to man directly, but to his domestic animals. Cattle, sheep, and hogs have undoubt-

Fig. 10.—An ungrazed woodlot favors the growth of trees and wild flowers.

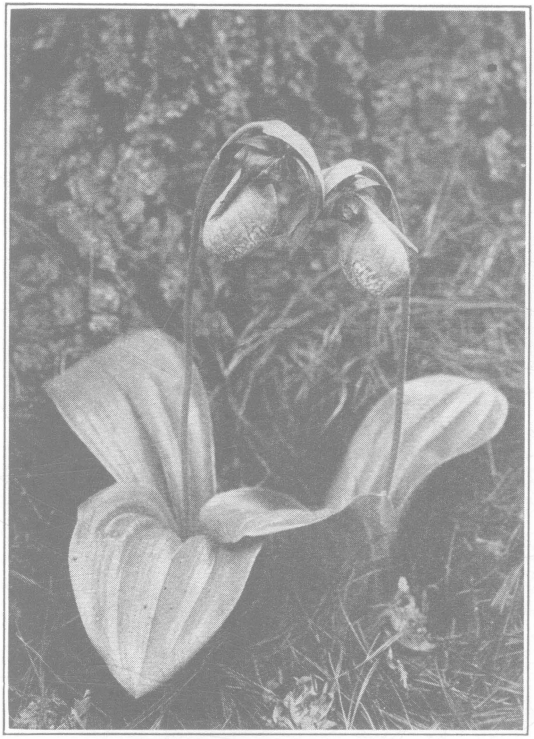

Fig. 11.—Pink Moccasin-flowers deserve our protection in woods where they are becoming scarce.

edly destroyed far more wild flowers than man himself. Usually the tenderer, more succulent grasses and herbs are eaten first. As the supply of feed plants diminishes, the stock are obliged to eat coarser and coarser plants, comparatively low in actual feed value. It is not uncommon to see small woodlots where hogs have uprooted all the sod and leaf mold, and have eaten every green plant except a few stout Jimson-weeds and coarse Thistles.

There is no question that, if any of us had to decide whether to have meat on the table or flowers on the table, we should choose the meat. However, there is a serious question as to whether the sparse grass in a shady woodlot is of much feed value compared with forage crops on the same land kept in pasture, but not overgrazed. Some real facts for thoughtful consideration have been presented in an article on Woodland Pasture by Welton and Morris, Ohio Experiment Station (Bi.-mo. Bul., Jan-Feb., 1929).

Few farmers who turn stock into a woodlot realize the deleterious effect of overgrazing on the growth of trees. Those who have become interested in the woodlot as a source of domestic lumber and firewood are enclosing their woodlots. The State Forester can furnish the farmer excellent advice in managing his woodlot successfully. An overgrazed woodlot is actually a double liability. Not only does it take up space which might more profitably be used for pasture or field crops, but it is also being rendered unfit for thrifty growth. The changes brought about by the removal of litter, the compacting and puddling of clay soil, exposure of roots, removal of bark, and destruction of young trees in the undergrowth, are such that a forest is scarcely able to grow or to reproduce itself.

In the last analysis each landowner must decide for himself whether to enclose the woodlot and protect it from stock, or to cut down most of the trees and establish a permanent pasture. Those who choose the former are incidentally establishing a preserve for the forest wild flowers, which are certain to disappear when grazed.

FIG. 12.—A LUXURIOUS SOCIETY OF VIRGINIA BLUEBELLS (MERTENSIA).

Conservation and Culture of Native Ferns

With all due regard to the importance of preserving our native wild flowers, we must not neglect their graceful companions, our native ferns. They are decreasing in abundance as rapidly if not more rapidly than our woodland wild flowers. Among the factors which have contributed to their depletion are the following:

1. Clearing of forests and draining of swamps have destroyed conditions which favored the growth of ferns.

2. Cattle, grazing in the woods, are particularly fond of these tender green plants. Two species, the Bracken and the Hay-scented Ferns, seem to be distasteful to cattle, but they are locally distributed in Ohio.

3. Digging ferns for purposes of transplanting has probably been of minor importance in this state. The greatest losses are due to the activities of collectors for firms which make a business of selling live plants. It is entirely feasible for nurserymen to grow from spores many of the species now taken from the woods.

4. Collecting fern leaves (fronds) for commercial uses is not a serious factor, if the rhizomes and smaller leaves are not destroyed in the process. This practice is now quite unnecessary, because commercial fern-culture is an established industry in Florida and other states.

On account of their delicate foliage and graceful forms, ferns are among the most attractive of flowerless plants. About forty-five different species of ferns are native to Ohio. They vary in size from the giant Ostrich-fern, with fronds often reaching a length of six feet, to the tiny Mountain Spleenwort, whose leaves resemble nothing more than a spray of parsley.

Ferns grow in a great variety of habitats, including peat bogs, crevices in rock cliffs, and the leaf-mold on the forest floor. Most of our native ferns succeed best on cool, moist, northern exposures, protected from wind and bright sunlight. This statement should be kept in mind when one attempts to grow ferns in a garden. The nearer we can approach primeval forest conditions, the better will be our chances of success in cultivating ferns.

Bringing ferns from the woods for planting in a garden often proves unsuccessful, owing to difficulties in transplanting them. Rhizomes of native plants may often be found growing in stony soils or in rock crevices. They can scarcely be removed without destroying much of the root system. Ferns grown in nurseries as a rule have much better roots, and for this reason it is recommended that stock be obtained where possible from growers rather than from the woods.

Larger Species of Native Ferns

Among the larger species recommended for planting are the following hardy native ferns; those marked with an asterisk are evergreen:

Broad Beech-fern *(Phegopteris hexagonoptera)*
Long Beech-fern *(Phegopteris phegopteris)*
Boulder Fern *(Dicksonia punctilobula)*
Christmas Fern *(Polystichum acrostichoides)**

Clayton's Fern *(Osmunda claytoniana)*
Eagle-fern or Bracken *(Pteridium aquilinum)*
Goldie's Shield-fern *(Aspidium goldianum)*
Lady-fern *(Athyrium filix-foemina) (Asplenium)*
Marginal Shield-fern *(Aspidium marginale)**
Narrow-leaved Spleenwort *(Asplenium angustifolium)*
New York Shield-fern *(Aspidium noveboracense)*
Ostrich-fern *(Onoclea struthiopteris)*
Silvery Spleenwort *(Athyrium thelypteroides) (Asplenium)*
Spinulose Shield-fern *(Aspidium spinulosum)*

Native Ferns for Soggy Places

For poorly drained situations, especially where the soil is moderately acid, the following native species will prove more successful:

Cinnamon-fern *(Osmunda cinnamomea)*
Crested Shield-fern *(Aspidium cristatum)**
Marsh Shield-fern *(Aspidium thelypteris)*
Royal Fern *(Osmunda regalis)*
Sensitive Fern *(Onoclea sensibilis)*

Laws Protecting Ferns and Wild Flowers

A Vermont law, enacted by the General Assembly and approved April 1, 1921, provides that "a person shall not take in any one year, except upon lands occupied by him, more than a single uprooted specimen or two cuttings of each of ten kinds of ferns and club-mosses, and then for scientific purposes only." The law protects in a similar way some twenty or more species of wild flowers, providing a fine of not more than ten dollars for each plant or additional cutting taken.

Such laws fail to accomplish their purpose unless rigidly enforced, and states seldom have sufficient funds to enforce them in an adequate way. It becomes increasingly important, then, that people be educated to recognize and appreciate the wild things around them. It is perhaps better that every child should know those truths and beauties which can only come from intimate contacts with nature. The love of nature instilled in the hearts of the children will greatly lessen the problem of protecting wild life, and will later develop an interest in the larger problems of conservation.

IMPORTANT CHARACTERISTICS WHICH DISTINGUISH FERN GROUPS

(See Fig. 13 Opposite)

1. Sensitive Fern—(a) frond; (b) spore bearing frond.
2. Hartford or Climbing Fern.
3. Grape Fern—(a) frond; (b) modified frond producing spore cases; (c) detail of spore cases.
4. Spleenwort—(a) frond; (b) spore cases like pockets above veins.
5. Common Polypody—(a) frond; (b) large fruiting dots.
6. Interrupted Fern—(a) spore-bearing pinnae (leaflets) confined to a few in middle of frond; (b) and (c) details showing arrangement of spore cases.
7. (a) Cinnamon Fern—Fertile frond.
8. Royal Fern—(a) frond; with (b) the modified pinnae at tip producing spores.
9. Maidenhair Fern (a) Pinnae; (b) detail showing spores beneath the folded margins of pinnae.
10. Bracken—(a) Entire frond; (b) detail of pinnae; (c) spore-bearing folded margins of a pinnule.
11. Chainfern—(a) Pinnae; (b) Spore areas in chains.
12. Christmas Fern—(a) frond; (b) spore cluster; (c) detail of spore clusters.
13. Bladderfern—(a) frond; (b) fruit dots.

Fig. 13.—Plate showing important characters which are used to distinguish fern groups. (Key to plate is shown opposite.)

Wild Flowers and Shrubs in Our Gardens

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Wild flowers may be used to great advantage in the development of our yards and gardens. There are several distinct ways in which this may be done. Those who are enthusiastic lovers of nature often develop a small part of their yard as a wild garden. We also find that some of our native wild flowers may be used to advantage in solving the proper planting of what might be called "problem spots" in the yard, those places where it is difficult

Fig. 14.—Group of Marsh Marigolds and Jack-in-the-Pulpits.

to make other plants grow. Wild flowers may be added very effectively to our flower borders of annual or perennial flowers to bring about continuity of bloom.

The Development of Wild Gardens

Wild gardens need not be confined to the large estate; they may be made any size, and adapted to the 50-foot lot or the 200-foot lot, provided precautions are taken to develop the site properly. The ideal plan is to have the wild garden as completely wild and naturalistic as possible. A portion of the yard should be set aside for this purpose alone; it may be sunny or it may

be in shade, but in either case it should have an adequate background and a setting of native shrubs and trees.

In developing this background, even though in most cases we purchase the shrubs from a nursery, it is not advisable to use specimen material. It is more in keeping to have the background irregular, scraggly. Occasionally, some of the shrubs that we may wish to use will be found growing so plentifully in certain places that they have almost become pests, and consequently may be collected without any danger of depleting their natural supply. Shrubs which may be used for this purpose are found in the list below. In planting them, since we are not using bushy plants, they should be set fairly close together and allowed to develop more or less into a thicket. Remember to put the taller growing shrubs to the back, and the lower ones to the front.

Native Shrubs for the Wild Garden

Hazelnut ..... *Corylus americana*
Spice Bush ..... *Benzoin aestivale*
Smooth Hydrangea ..... *Hydrangea arborescens*
Witch-hazel ..... *Hamamelis virginiana*
Shining Sumac ..... *Rhus copallina*
Winterberry ..... *Ilex verticillata*
Wahoo ..... *Euonymus atropurpureus*
Bladdernut ..... *Staphylea trifolia*
Hoptree ..... *Ptelea trifoliata*
Gray Dogwood ..... *Cornus paniculata*
Pagoda Wood ..... *Cornus alternifolia*
Button Bush ..... *Cephalanthus occidentalis*
Mapleleaf Viburnum ..... *Viburnum acerifolium*
Nannyberry ..... *Viburnum lentago*
Blackhaw ..... *Viburnum prunifolium*
Sourwood ..... *Oxydendrum arboreum*

Small Trees for Wild Gardens

It may be necessary to develop shade where the existing trees are not adequate for this purpose. The following list of native trees may be used to advantage for this purpose. It will be found that several of them will decorate our gardens during the spring and early summer with their glorious flowers.

American Hornbeam ..... *Carpinus caroliniana*
Sassafras ..... *Sassafras variifolium*
American Crab ..... *Pyrus coronaria*
Hawthorns ..... *Crataegus*
Redbud ..... *Cercis canadensis*
Striped Maple ..... *Acer pennsylvanicum*
Flowering Dogwood ..... *Cornus florida*
Shadblow ..... *Amelanchier canadensis*

Placing the Wild Garden

Where in our yards will we find a place that we can develop planting such as this? It may be the area in back of the garage, it may be the space

Fig. 15.—"Ghost flowers" of Indian-pipe growing among Club-mosses.

between our flower garden and the rear property line, or it may be the space between the house and the side of the lot, if the houses faces the east or west.

A strip say 10 feet wide and 20 feet long may be developed into a most interesting wild garden, or an odd corner beneath a few flowering dogwoods may be carpeted with wild flowers to give an equally interesting effect.

It is not proper, however, to develop a wild garden along the side of the house or buildings unless an adequate planting of shrubs, preferably native ones developed to at least partially screen the view of the house foundation, is present.

Nothing is more pitiful than a group of beautiful Lady's-slippers or other dainty wild flowers growing between the concrete drive and the foundation wall of the house, or between the coal window and the laundry-room window. They seem so out of place and so foreign to their environment. This should be our idea in the development of any wild garden—suitability to environment.

If the more vigorous growing plants are used, such as the Crane's-bill, the Buttercup, or the Bergamot, this garden would require little care.

Planting "Problem" Spots

Every yard has one or more what might be called "problem" spots—areas usually so shady that it is difficult to grow the average flower in such a location. This area may be a little strip between the house and the side yard; it may be a small strip along the side of the garage or in back of the garage; it may be a bank or terrace; it may be the space beneath heavy shade trees such as the Norway Maples. These places, as they are in the shade, may be beautified by the use of some of the more vigorous of our native woods plants: the wild Ginger, the wild blue Phlox, the Mayapple, or the Solomon's Seal. The Bergamot and the Meadow Rue can always be depended upon.

For dry, sunny slopes where grass is impossible, wild flowers such as the Crane's-bill, Bouncing-bet and Horsetail may be relied on. Possibly you may object and say these are not wild flowers; but we would rather have such plants than a bare, ugly bank. Bare areas beneath shrubs and trees, provided they are inclosed by walks or drives so that the material cannot escape into the lawn or flower beds, may be carpeted with the Moneywort *(Lysimachia nummularia)*.

Wild flowers when used in the perennial border are especially desirable because of their early spring bloom. The Virginia Cowslip, the Trillium, the Jacob's-ladder and the Bloodroot are especially desirable for this purpose. Nor should we overlook our summer roadside wild flowers, the Goldenrod, the wild Aster, the Butterfly Weed, and the Turtlehead. Many very fine gardens will be found to contain these and other of our summer wild flowers.

Fig. 16.—Iris cristata in a rock-garden.

Soil Preparation

Success with wild flowers, especially those which are normally found in the woods, can be obtained only when proper soil preparation is made. It is not fair to the plants to force them to grow in heavy clay which in many cases has come from the cellar excavation. On the other hand, it is surprising the results that may be obtained from these same wild flowers if a little attention is given to the proper preparation of the soil.

The first requirement for growing the majority of our woodland wild flowers is that the soil contain a relatively large amount of organic matter (humus). Since it is seldom that the soil around our homes contains this material in sufficient quantity, it will be

necessary for us to add it. Some people prefer to obtain this material from the woods but there is no reason why it cannot be obtained in other ways. If, each year, we save the leaves from our trees, pile them in the back corner of the yard and allow them to decay, some very fine leaf mold will result in a year's time. It is also possible to decompose straw in the same manner.

If these materials are not available, equally good results may be obtained from the use of peat moss, which may be purchased from a local florist or nurseryman. If your soil is a heavy clay, the addition of a liberal amount of sand will be beneficial. By the time the soil is ready to plant it should be

Fig. 17.—The Mountain Laurel holds front rank among our broadleaved evergreen shrubs. An acid soil reaction is required for successful cultivation.

roughly comprised of equal parts leaf mold, soil, and sand. This material should be at least 6 inches deep, and preferably deeper.

As previously stated, soil preparation is essential if you wish to transplant these natives of the woods. If you are not going to make this effort, you should not attempt a wild flower garden.

Drainage is also essential. If your wild garden is in a low part of the yard the level should be raised above the surrounding soil so that there is no chance of water standing on it at any season of the year. If it be on a slope but inclined to be overmoist, one or two rows of drain tile will be found effective.

Soil Acidity

Many of our wild flowers are highly tolerant of the acidity of the soil in which they grow. They may be grown in either slightly acid, neutral, or

slightly alkaline soil. The list of flowers for shady places will be found to come under this head (see below).

Certain other plants grow satisfactorily only if the soil is considerably acid. In gardens where the soil is not acid it may be treated by the application of an acid peat moss, sulfur, aluminum sulfate, or tannic acid to produce the necessary acidity. It is also possible to incorporate oak or chestnut sawdust with the soil. This will be necessary at least once a season.

The plants in list on page 26 are those which demand an acid soil. In this same soil Rhododendrons, Azaleas, and Mountain-laurel may be grown.

Easily Grown Wild Flowers for Shady Places

Soil Slightly Acid to Slightly Alkaline

Alumroot	*Heuchera americana*
Beebalm	*Monarda didyma*
Bellwort	*Uvularia grandiflora*
Black Snakeroot	*Cimicifuga racemosa*
Bloodroot	*Sanguinaria canadensis*
Columbine	*Aquilegia canadensis*
Crane's-bill	*Geranium maculatum*
Creeping Buttercup	*Ranunculus repens*
Crested Iris	*Iris cristata*
Dutchman's-breeches	*Dicentra cucullaria*
False Solomon's Seal	*Smilacina racemosa*
Foam-flower	*Tiarella cordifolia*
Jack-in-the-pulpit	*Arisaema triphyllum*
Jacobs-ladder	*Polemonium reptans*
Liverwort	*Hepatica triloba*
Mayapple	*Podophyllum peltatum*
Moss-pink	*Phlox subulata*
Rue Anemone	*Anemonella thalictroides*
Shooting-star	*Dodocatheon meadia*
Showy Lady's-slipper	*Cypripedium spectabile*
Solomon's Seal	*Polygonatum biflorum*
Spring-beauty	*Claytonia virginica*
Trillium	*Trillium grandiflorum*
Trout-lily	*Erythronium americanum*
Twinleaf	*Jeffersonia diphylla*
Violets	*Viola*
Virginia Cowslip	*Mertensia virginica*
Wake-robin	*Trillium erectum*
White Snakeroot (Poisonous to cattle)	*Eupatorium urticaefolium*
Wild Blue Phlox	*Phlox divaricata*
Wild Ginger	*Asarum canadense*
Yellow Lady's-slipper	*Cypripedium pubescens*

Fertilizers for the Wild Flower Bed

Most wild flowers will be found to respond to fertilizers. These may be applied either in the form of rotted barnyard manure or as commercial

fertilizers. A complete fertilizer with the ratio of 4 per cent nitrogen, 12 per cent phosphoric acid and 4 per cent potash will be found satisfactory. This can be broadcast in the early spring at the rate of two to three pounds to 100 square feet.

Winter Protection

Although our native plants are hardy, if we attempt to grow those from other sections of the country we will find they sometimes require a mulch of leaves or peat moss during the winter. Any flower garden, however, in which woodland plants are grown will be benefited by a liberal mulch of leaves. This may be left on and allowed to decompose. It will also tend to add to the natural effect.

Fig. 18.—Those who seek for beauty in wild flowers will find it in the Purple-fringed Orchid.

What to Plant

The choice of plants will depend to a large extent on the individual personal taste. Those found in the list on page 25, "Wild Flowers for Shady Places," are among the more showy of our native woodland plants.

The question which arises is the source of the material to plant. It is highly desirable, especially in those sections of the state where our wild flowers are fast disappearing, to secure material by purchasing it from nurseries where the plants are grown and propagated.

Plants for Acid Soils

Bluebeads (Yellow Clintonia)	*Clintonia borealis*
Cinnamon Fern	*Osmunda cinnamomea*
Common Brake	*Pteris aquilina*
Moccasinflower	*Cypripedium acaule*
Partridge-berry	*Mitchella repens*
Pitcher Plant	*Sarracenia purpurea*
Rattlesnake-plantain	*Epipactis*
Royal Fern	*Osmunda regalis*
Trailing Arbutus	*Epigaea repens*
Twinflower	*Linnaea borealis*
Wintergreen	*Gaultheria procumbens*

Plants for Sunny Places

(Use good garden soil)

Asters, Wild ..... *Aster*
Bergamot ..... *Monarda fistulosa*
Black-eyed-Susan ..... *Rudbeckia hirta*
Blue-eyed-grass ..... *Sisyrinchium*
Bluets ..... *Houstonia caerulea*
Butterfly-weed ..... *Asclepias tuberosa*
Cardinal-flower ..... *Lobelia cardinalis*
Crane's-bill ..... *Geranium maculatum*
Culver's-physic ..... *Veronica virginica*
Gayfeather ..... *Liatris*
Goldenrod ..... *Solidago*
Helen's-flower ..... *Helenium autumnale*
Joe-Pye-weed ..... *Eupatorium purpureum*
Phlox, Blue ..... *Phlox divaricata*
Phlox, Moss ..... *Phlox subulata*
Rosemallow ..... *Hibiscus moscheutos*
Senna, Wild ..... *Cassia marilandica*
Speedwell, Common ..... *Veronica officinalis*
(Makes a good ground cover)
Spurge, Flowering ..... *Euphorbia corollata*

Plants for Wet Places

Arrowhead ..... *Sagittaria latifolia*
Boneset ..... *Eupatorium perfoliatum*
Cardinal-flower ..... *Lobelia cardinalis*
Dragonhead, False ..... *Physostegia virginiana*
Flag, Blue ..... *Iris versicolor*
Forget-me-not ..... *Myosotis palustris*
Joe-Pye-weed ..... *Eupatorium purpureum*
Loosestrife, Purple ..... *Lythrum salicaria*
Marsh-marigold ..... *Caltha palustris*
Meadowbeauty ..... *Rhexia virginica*
Milkweed, Swamp ..... *Asclepias incarnata*
Monkeyflower ..... *Mimulus ringens*
Rosemallow ..... *Hibiscus moscheutos*
Turtlehead ..... *Chelone glabra*

Shrubs for Wet Places

Blueberry, Highbush ..... *Vaccinium corymbosum*
Buttonbush ..... *Cephalanthus occidentalis*
Cinquefoil, Shrubby ..... *Potentilla fruticosa*
Hardhack ..... *Spirea tomentosa*
Meadow Spirea ..... *Spirea latifolia*
Pussy Willow ..... *Salix discolor*
Spicebush ..... *Benzoin aestivale*
Summersweet ..... *Clethra alnifolia*
Winterberry ..... *Ilex verticillata*

SELECTED REFERENCES

Blanchan, Neltje. NATURE'S GARDEN. The Nature Library Series. (Doubleday-Doran)

Durand, Herbert. WILD FLOWERS AND FERNS. (Putnams). Contains excellent cultural notes.

House, Homer D. WILD FLOWERS OF NEW YORK. (New York State Museum, Albany). Contains a splendid set of 264 colored plates, issued separately.

Keeler, Harriet L. OUR NORTHERN SHRUBS. (Scribners)

Matthews, F. Schuyler. FIELD BOOK OF AMERICAN WILD FLOWERS. (Putnams). Perhaps the best illustrated handbook for the amateur.

"WILD FLOWER." Official organ of the Wild Flower Preservation Society, Inc., Washington, D. C. Published quarterly by the Ohio Chapter at Cincinnati.

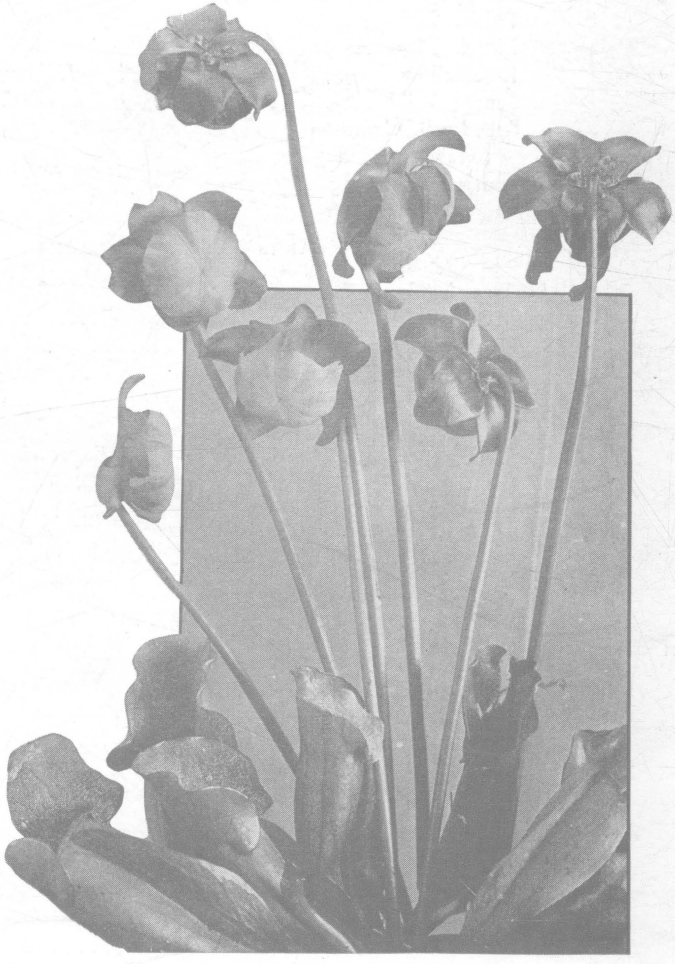

Fig. 19.—Few persons have seen the curious Pitcher-plant in its natural surroundings.